LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

IWM Consulting Group
7428 Rockville Road
Indianapolis, IN 46214
ATTN: Brad Gentry

December 19, 2018

SUBJECT: Former Amphenol Facility, Data Validation

Dear Mr. Gentry,

Enclosed is the final validation report for the fraction listed below. This SDG was received on December 17, 2018. Attachment 1 is a summary of the samples that were reviewed for analysis.

LDC Project #43939:

SDG #	**Fraction:**
10457589	Volatiles

The data validation was performed under Level III & IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- The 11-29-2018 Email to EPA - 980 Hurricane Road Proposed Sampling Locations, the Residential Vapor Intrusion Investigation Work Plan for Priority Residences, Franklin Power Products, Inc./Amphenol Corporation, Franklin, Indiana; September 2018
- USEPA National Functional Guidelines for Organic Superfund Methods Data Review; January 2017

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
Project Manager/Senior Chemist

1,091 pages-DL ASAP Attachment 1

90/10

LDC #43939 (IWM Consulting Group - Indianapolis, IN / Former Amphenol Facility, Facility)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (TO-15-S)																															
Matrix:	Air/Water/Soil			A	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	10457589	12/17/18	ASAP	8	0																														
A	10457589	12/17/18	ASAP	1	0																														
Total	T/PG			9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9

Shaded cells indicate Level IV validation (all other cells are Level III validation). These counts do not include MS, MSD, Dups.

L:\IWM\Former Amphenol\43939ST-Facility.wpd

LDC Report# 43939A48

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Former Amphenol Facility

LDC Report Date: December 19, 2018

Parameters: Volatiles

Validation Level: Level III & IV

Laboratory: Pace Analytical Services, LLC.

Sample Delivery Group (SDG): 10457589

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
AA-1 (Facility)	10457589001	Air	12/04/18
AA-2 upwind (Facility)	10457589003	Air	12/04/18
IA-MF1 (Facility)	10457589005	Air	12/04/18
IA-FD1 (Facility)	10457589007	Air	12/04/18
IA-MF2 (Facility)**	10457589009**	Air	12/04/18
IA-MF3 (Facility)	10457589011	Air	12/04/18
IA-MF4 (Facility)	10457589013	Air	12/04/18
IA-MF5 (Facility)	10457589015	Air	12/04/18
IA-MF6 (Facility)	10457589017	Air	12/04/18
AA-1 (Facility)DUP	10457589001DUP	Air	12/04/18

**Indicates sample underwent Level IV validation

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December 19, 2018

SUBJECT: Former Amphenol Facility, Data Validation

Dear Mr. Gentry,

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LDC Project #43939:

SDG #	**Fraction:**
10457589	Volatiles

The data validation was performed under Level III & IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- The 11-29-2018 Email to EPA - 980 Hurricane Road Proposed Sampling Locations, the Residential Vapor Intrusion Investigation Work Plan for Priority Residences, Franklin Power Products, Inc./Amphenol Corporation, Franklin, Indiana; September 2018
- USEPA National Functional Guidelines for Organic Superfund Methods Data Review; January 2017

Please feel free to contact us if you have any questions.

Sincerely,

Pei Geng
Project Manager/Senior Chemist

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the 11-29-2018 Email to EPA – 980 Hurricane Road Proposed Sampling Locations, the Residential Vapor Intrusion Investigation Work Plan for Priority Residences (PRWP), Franklin Power Products, Inc./Amphenol Corporation, Franklin, Indiana (September 2018), and a modified outline of the USEPA National Functional Guidelines (NFG) for Organic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) Method TO-15 and EPA Method TO-15 in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Level III data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Level IV data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound for analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

The canisters were properly pressurized and handled.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A bromofluorobenzene (BFB) tune was performed at 24 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For compounds where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 30.0%.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all compounds.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

Canister blank analyses were performed for every sample canister. No contaminants were found in the canister blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples IA-MF1 (Facility) and IA-FD1 (Facility) were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/m³)		RPD
	IA-MF1 (Facility)	IA-FD1 (Facility)	
1,2-Dichloroethane	0.35	0.34	3
cis-1,2-Dichloroethene	0.32	0.068U	Not calculable
Methylene chloride	6.3	5.9U	Not calculable
Tetrachloroethene	2.4	2.2	9
1,1,1-Trichloroethane	2.9	2.8	4
Trichloroethene	0.92	0.89	3

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Level IV validation.

The laboratory reporting limit (RL) was less than or equal to the Resident Vapor Intrusion (VI) Screening Levels with the following exceptions:

Sample	Compound	Laboratory RL	Resident VI Screening Level
IA-MF6 (Facility)	1,2-Dichloroethane Trichloroethene Vinyl chloride	0.61 ug/m^3 0.81 ug/m^3 0.39 ug/m^3	0.11 ug/m^3 0.48 ug/m^3 0.17 ug/m^3

The laboratory indicated that sample IA-MF6 (Facility) was diluted at 14.9X due to presence of high levels of non-target analytes or other matrix interference.

Raw data were not reviewed for Level III validation.

XIII. Target Compound Identifications

All target compound identifications met validation criteria for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XIV. System Performance

The system performance was acceptable for samples which underwent Level IV validation. Raw data were not reviewed for Level III validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

Former Amphenol Facility
Volatiles - Data Qualification Summary - SDG 10457589

No Sample Data Qualified in this SDG

Former Amphenol Facility
Volatiles - Laboratory Blank Data Qualification Summary - SDG 10457589

No Sample Data Qualified in this SDG

Former Amphenol Facility
Volatiles - Field Blank Data Qualification Summary - SDG 10457589

No Sample Data Qualified in this SDG

Pace Analytical Services, LLC
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Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: IN.AMP 18.01 Former Amphenol
Pace Project No.: 10457589

Sample: AA-1 (Facility) **Lab ID: 10457589001** Collected: 12/04/18 15:36 Received: 12/05/18 10:10 Matrix: Air

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR SIM SCAN	Analytical Method: TO-15							
1,1-Dichloroethane	ND	ug/m3	0.069	1.68		12/05/18 16:57	75-34-3	
1,2-Dichloroethane	**0.075**	ug/m3	0.069	1.68		12/05/18 16:57	107-06-2	
cis-1,2-Dichloroethene	ND	ug/m3	0.068	1.68		12/05/18 16:57	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	0.068	1.68		12/05/18 16:57	156-60-5	
Methylene Chloride	**6.2**	ug/m3	5.9	1.68		12/05/18 16:57	75-09-2	
Tetrachloroethene	**0.14**	ug/m3	0.12	1.68		12/05/18 16:57	127-18-4	
1,1,1-Trichloroethane	ND	ug/m3	0.093	1.68		12/05/18 16:57	71-55-6	
Trichloroethene	ND	ug/m3	0.092	1.68		12/05/18 16:57	79-01-6	
Vinyl chloride	ND	ug/m3	0.044	1.68		12/05/18 16:57	75-01-4	

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ANALYTICAL RESULTS

Project: IN.AMP 18.01 Former Amphenol
Pace Project No.: 10457589

Sample: AA-2 upwind (Facility) **Lab ID: 10457589003** Collected: 12/04/18 15:28 Received: 12/05/18 10:10 Matrix: Air

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR SIM SCAN	Analytical Method: TO-15							
1,1-Dichloroethane	ND	ug/m3	0.066	1.61		12/05/18 17:53	75-34-3	
1,2-Dichloroethane	**0.079**	ug/m3	0.066	1.61		12/05/18 17:53	107-06-2	
cis-1,2-Dichloroethene	ND	ug/m3	0.065	1.61		12/05/18 17:53	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	0.065	1.61		12/05/18 17:53	156-60-5	
Methylene Chloride	ND	ug/m3	5.7	1.61		12/05/18 17:53	75-09-2	
Tetrachloroethene	**0.15**	ug/m3	0.11	1.61		12/05/18 17:53	127-18-4	
1,1,1-Trichloroethane	ND	ug/m3	0.089	1.61		12/05/18 17:53	71-55-6	
Trichloroethene	**0.091**	ug/m3	0.088	1.61		12/05/18 17:53	79-01-6	
Vinyl chloride	ND	ug/m3	0.042	1.61		12/05/18 17:53	75-01-4	

12/19/18

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ANALYTICAL RESULTS

Project: IN.AMP 18.01 Former Amphenol
Pace Project No.: 10457589

Sample: IA-MF1 (Facility) **Lab ID: 10457589005** Collected: 12/04/18 15:45 Received: 12/05/18 10:10 Matrix: Air

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR SIM SCAN	Analytical Method: TO-15							
1,1-Dichloroethane	ND	ug/m3	0.072	1.75		12/05/18 18:21	75-34-3	
1,2-Dichloroethane	**0.35**	ug/m3	0.072	1.75		12/05/18 18:21	107-06-2	
cis-1,2-Dichloroethene	**0.32**	ug/m3	0.071	1.75		12/05/18 18:21	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	0.071	1.75		12/05/18 18:21	156-60-5	
Methylene Chloride	**6.3**	ug/m3	6.2	1.75		12/05/18 18:21	75-09-2	
Tetrachloroethene	**2.4**	ug/m3	0.12	1.75		12/05/18 18:21	127-18-4	
1,1,1-Trichloroethane	**2.9**	ug/m3	0.097	1.75		12/05/18 18:21	71-55-6	
Trichloroethene	**0.92**	ug/m3	0.096	1.75		12/05/18 18:21	79-01-6	
Vinyl chloride	ND	ug/m3	0.046	1.75		12/05/18 18:21	75-01-4	

12/18/18

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: IN.AMP 18.01 Former Amphenol
Pace Project No.: 10457589

Sample: IA-FD1 (Facility) **Lab ID: 10457589007** Collected: 12/04/18 15:45 Received: 12/05/18 10:10 Matrix: Air

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR SIM SCAN	Analytical Method: TO-15							
1,1-Dichloroethane	ND	ug/m3	0.069	1.68		12/05/18 18:48	75-34-3	
1,2-Dichloroethane	**0.34**	ug/m3	0.069	1.68		12/05/18 18:48	107-06-2	
cis-1,2-Dichloroethene	ND	ug/m3	0.068	1.68		12/05/18 18:48	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	0.068	1.68		12/05/18 18:48	156-60-5	
Methylene Chloride	ND	ug/m3	5.9	1.68		12/05/18 18:48	75-09-2	
Tetrachloroethene	**2.2**	ug/m3	0.12	1.68		12/05/18 18:48	127-18-4	
1,1,1-Trichloroethane	**2.8**	ug/m3	0.093	1.68		12/05/18 18:48	71-55-6	
Trichloroethene	**0.89**	ug/m3	0.092	1.68		12/05/18 18:48	79-01-6	
Vinyl chloride	ND	ug/m3	0.044	1.68		12/05/18 18:48	75-01-4	

12/18/18

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: IN.AMP 18.01 Former Amphenol
Pace Project No.: 10457589

Sample: IA-MF2 (Facility) **Lab ID: 10457589009** Collected: 12/04/18 15:52 Received: 12/05/18 10:10 Matrix: Air

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR SIM SCAN	Analytical Method: TO-15							
1,1-Dichloroethane	ND	ug/m3	0.085	2.06		12/05/18 21:07	75-34-3	
1,2-Dichloroethane	**0.29**	ug/m3	0.085	2.06		12/05/18 21:07	107-06-2	
cis-1,2-Dichloroethene	**0.84**	ug/m3	0.083	2.06		12/05/18 21:07	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	0.083	2.06		12/05/18 21:07	156-60-5	
Methylene Chloride	**42.8**	ug/m3	7.3	2.06		12/05/18 21:07	75-09-2	
Tetrachloroethene	**3.1**	ug/m3	0.14	2.06		12/05/18 21:07	127-18-4	
1,1,1-Trichloroethane	**2.8**	ug/m3	0.11	2.06		12/05/18 21:07	71-55-6	
Trichloroethene	**1.2**	ug/m3	0.11	2.06		12/05/18 21:07	79-01-6	
Vinyl chloride	ND	ug/m3	0.054	2.06		12/05/18 21:07	75-01-4	

SL 12/18/18

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: IN.AMP 18.01 Former Amphenol
Pace Project No.: 10457589

Sample: IA-MF3 (Facility) **Lab ID: 10457589011** Collected: 12/04/18 15:56 Received: 12/05/18 10:10 Matrix: Air

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR SIM SCAN	Analytical Method: TO-15							
1,1-Dichloroethane	ND	ug/m3	0.064	1.55		12/05/18 19:16	75-34-3	
1,2-Dichloroethane	**0.35**	ug/m3	0.064	1.55		12/05/18 19:16	107-06-2	
cis-1,2-Dichloroethene	ND	ug/m3	0.062	1.55		12/05/18 19:16	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	0.062	1.55		12/05/18 19:16	156-60-5	
Methylene Chloride	ND	ug/m3	5.5	1.55		12/05/18 19:16	75-09-2	
Tetrachloroethene	**5.9**	ug/m3	0.11	1.55		12/05/18 19:16	127-18-4	
1,1,1-Trichloroethane	**3.4**	ug/m3	0.086	1.55		12/05/18 19:16	71-55-6	
Trichloroethene	**3.0**	ug/m3	0.085	1.55		12/05/18 19:16	79-01-6	
Vinyl chloride	ND	ug/m3	0.040	1.55		12/05/18 19:16	75-01-4	

12/18/18

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: IN.AMP 18.01 Former Amphenol
Pace Project No.: 10457589

Sample: IA-MF4 (Facility) **Lab ID: 10457589013** Collected: 12/04/18 15:53 Received: 12/05/18 10:10 Matrix: Air

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR SIM SCAN	Analytical Method: TO-15							
1,1-Dichloroethane	**0.12**	ug/m3	0.069	1.68		12/05/18 21:35	75-34-3	
1,2-Dichloroethane	**0.36**	ug/m3	0.069	1.68		12/05/18 21:35	107-06-2	
cis-1,2-Dichloroethene	**1.8**	ug/m3	0.068	1.68		12/05/18 21:35	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	0.068	1.68		12/05/18 21:35	156-60-5	
Methylene Chloride	ND	ug/m3	5.9	1.68		12/05/18 21:35	75-09-2	
Tetrachloroethene	**6.5**	ug/m3	0.12	1.68		12/05/18 21:35	127-18-4	
1,1,1-Trichloroethane	**3.4**	ug/m3	0.093	1.68		12/05/18 21:35	71-55-6	
Trichloroethene	**2.7**	ug/m3	0.092	1.68		12/05/18 21:35	79-01-6	
Vinyl chloride	ND	ug/m3	0.044	1.68		12/05/18 21:35	75-01-4	

12/18/18

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ANALYTICAL RESULTS

Project: IN.AMP 18.01 Former Amphenol
Pace Project No.: 10457589

Sample: IA-MF5 (Facility) **Lab ID: 10457589015** Collected: 12/04/18 16:01 Received: 12/05/18 10:10 Matrix: Air

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR SIM SCAN	Analytical Method: TO-15							
1,1-Dichloroethane	ND	ug/m3	0.065	1.58		12/05/18 19:44	75-34-3	
1,2-Dichloroethane	**0.34**	ug/m3	0.065	1.58		12/05/18 19:44	107-06-2	
cis-1,2-Dichloroethene	ND	ug/m3	0.064	1.58		12/05/18 19:44	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	0.064	1.58		12/05/18 19:44	156-60-5	
Methylene Chloride	**6.7**	ug/m3	5.6	1.58		12/05/18 19:44	75-09-2	
Tetrachloroethene	**1.1**	ug/m3	0.11	1.58		12/05/18 19:44	127-18-4	
1,1,1-Trichloroethane	**2.4**	ug/m3	0.088	1.58		12/05/18 19:44	71-55-6	
Trichloroethene	**0.94**	ug/m3	0.086	1.58		12/05/18 19:44	79-01-6	
Vinyl chloride	ND	ug/m3	0.041	1.58		12/05/18 19:44	75-01-4	

12/18/18

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: IN.AMP 18.01 Former Amphenol
Pace Project No.: 10457589

Sample: IA-MF6 (Facility) **Lab ID: 10457589017** Collected: 12/04/18 16:14 Received: 12/05/18 10:10 Matrix: Air

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR SIM SCAN	Analytical Method: TO-15							
1,1-Dichloroethane	ND	ug/m3	0.61	14.9		12/06/18 10:48	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.61	14.9		12/06/18 10:48	107-06-2	
cis-1,2-Dichloroethene	ND	ug/m3	0.60	14.9		12/06/18 10:48	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	0.60	14.9		12/06/18 10:48	156-60-5	
Methylene Chloride	ND	ug/m3	52.6	14.9		12/06/18 10:48	75-09-2	
Tetrachloroethene	ND	ug/m3	1.0	14.9		12/06/18 10:48	127-18-4	
1,1,1-Trichloroethane	ND	ug/m3	0.83	14.9		12/06/18 10:48	71-55-6	
Trichloroethene	ND	ug/m3	0.81	14.9		12/06/18 10:48	79-01-6	
Vinyl chloride	ND	ug/m3	0.39	14.9		12/06/18 10:48	75-01-4	D3

SC 121818

REPORT OF LABORATORY ANALYSIS

LDC #: 43939A48 **VALIDATION COMPLETENESS WORKSHEET** Date: 2/18/19
SDG #: 10457589 Level III/IV Page: 1 of 1
Laboratory: Pace Analytical Services, LLC Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA Method TO-15/SIM ~~Scan~~)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	RSD ≤ 30, r² 1 ≤ 30
IV.	Continuing calibration	A	D ≤ 30
V.	Laboratory Blanks/Canister Blanks per sample	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates /DUP	N/A	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	SW	D = 3+4
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	SW	Not reviewed for Level III validation.
XIII.	Target compound identification	A	Not reviewed for Level III validation.
XIV.	System performance	A	Not reviewed for Level III validation.
XV.	Leak Check Compounds	A	
XVI.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	AA-1 (Facility)	10457589001	Air	12/04/18
2	AA-2 upwind (Facility)	10457589003	Air	12/04/18
3	IA-MF1 (Facility)	10457589005	Air	12/04/18
4	IA-FD1 (Facility)	10457589007	Air	12/04/18
5	IA-MF2 (Facility)**	10457589009**	Air	12/04/18
6	IA-MF3 (Facility)	10457589011	Air	12/04/18
7	IA-MF4 (Facility)	10457589013	Air	12/04/18
8	IA-MF5 (Facility)	10457589015	Air	12/04/18
9 2	IA-MF6 (Facility)	10457589017	Air	12/04/18
10	AA-1 (Facility)DUP	10457589001DUP	Air	12/04/18
11				
12				

1 314239MB
2 314277 MB

LDC #: 43939A48

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: MC
2nd Reviewer: M

Method: Volatiles (EPA Method TO-15)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was canister pressure criteria met?	✓			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 24 hour clock criteria?	✓			
III. Initial calibration/Initial calibration verification				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 30%?	✓			
Was a curve fit used for evaluation and did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?	✓			
Was an initial calibration verification standard analyzed after every ICAL for each instrument?	✓			
Were all percent differences (%D) ≤ 30% or percent recoveries (%R) 70-130%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 24 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 30% or percent recoveries (%R) 70-130%?	✓			
V. Laboratory Blanks/Canister Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed at least once every 24 hours for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks?		✓		
Was a canister blank analyzed for every canister?	✓			
Was there contamination in the canister blanks?		✓		
VI. Field Blanks				
Were field blanks identified in this SDG?		✓		
Were target compounds detected in the field blanks?			✓	
VII. Surrogate spikes (Optional)				
Were all surrogate percent recoveries (%R) within QC limits?			✓	
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VIII. Laboratory Duplicate				
Was a laboratory duplicate analyzed for this SDG?	✓			
Were the relative percent differences (RPD) within the QC limits?	✓			

LDC #: 43939A4C

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: AC
2nd Reviewer: AC

Validation Area	Yes	No	NA	Findings/Comments
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
XI. Internal standards				
Were internal standard area counts within ± 40% from the associated calibration standard?	✓			
Were retention times within ± 20.0 seconds from the associated calibration standard?	✓			
XII. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within + 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	U. 1,1,2-Trichloroethane			
B. Bromomethane	V. Benzene			
C. Vinyl choride	W. trans-1,3-Dichloropropene			
D. Chloroethane	X. Bromoform			
E. Methylene chloride	Y. 4-Methyl-2-pentanone			
F. Acetone	Z. 2-Hexanone			
G. Carbon disulfide	AA. Tetrachloroethene			
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane			
I. 1,1-Dichloroethane	CC. Toluene			
J. 1,2-Dichloroethene, total	DD. Chlorobenzene			
K. Chloroform	EE. Ethylbenzene			
L. 1,2-Dichloroethane	FF. Styrene			
M. 2-Butanone	GG. Xylenes, total			
N. 1,1,1-Trichloroethane				
O. Carbon tetrachloride				
P. Bromodichloromethane				
Q. 1,2-Dichloropropane				
R. cis-1,3-Dichloropropene				
S. Trichloroethene				
T. Dibromochloromethane				

LDC #: 43939A48

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: [illegible]
2nd reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method TO15 Full Scan/TO15-SIM)

Compound	Concentration (ug/m3)		RPD
	3	4	
L	0.35	0.34	3
QQQ	0.32	0.068U	NC
E	6.3	5.9U	NC
AA	2.4	2.2	9
N	2.9	2.8	4
S	0.92	0.89	3

LDC #: 43939A48

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and RLs

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method TO-15)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?

Y N N/A Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?

#	Date	Sample ID	Compound	Findings	Qualifications
		9	diluted at	14.9x	text see attached
			Regional Screening	Levels Lab RL	
		L	0.11 ug/m3	0.61	
		S	0.48	0.81	
		C	0.17	0.39	

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QUALIFIERS

Project: IN.AMP 18.01 Former Amphenol
Pace Project No.: 10457589

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

#9 @ 14.9x

LDC #: 43939A88

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: JR
2nd Reviewer: JR

METHOD: GC/MS VOA (EPA Method TO-15)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs
X = Mean of the RRFs

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (10 std)	Recalculated RRF (10 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	1QL	12/4/18	E (1st internal standard) (50ft2)	0.14799	0.14799	0.16163	0.16163	10.95291	10.95354
			AA (2nd internal standard)	0.43910		0.42068	0.42068	13.59484	13.59484
			(3rd internal standard)						
2			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
3			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
4			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC#: 43939A48

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: AC
2nd Reviewer: PZ

Method:GC/MS VOA (EPA Method TO-15/TO-15 SIM)

Calibration Date	GCMS	Compound	Standard	(X) Response ratio	(Y) Concentration ratio
12/4/2018	10AIRB	Trichloroethene (SIM)	1	0.00013	0.001
			2	0.00023	0.001
			3	0.00052	0.002
			4	0.00129	0.01
			5	0.00247	0.01
			6	0.00481	0.02
			7	0.00705	0.03

Regression Output	***Calculated***	***Reported***
Constant	*0.000057*	*0.00006*
R Squared	*0.9995439*	*0.99954*
X Coefficient(s)	*0.235158*	*0.23516*
Correlation Coefficient	*0.9997719*	
Coefficient of Determination (r^2)	*0.9995439*	*0.99954*

LDC #: 43939A48

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: A
2nd Reviewer: F

METHOD: GC/MS VOA (EPA TO-15)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	33902	12/5/18	S (1st internal standard) (SIM)	0.100000	0.10174	0.10161	1.74225	1.60940
			(2nd internal standard)					
			(3rd internal standard)					
2	33903	12/5/18	E (1st internal standard)	0.16163	0.14450	0.14450	10.60210	10.60135
			AA (2nd internal standard)	0.42068	0.41486	0.41486	1.38158	1.38246
			(3rd internal standard)					
3			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
4			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43939A48

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: [illegible]
2nd reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method TO-15)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

RRF = Relative response factor of the calibration standard.

V_o = Volume or weight of sample pruged in milliliters (ml) or grams (g).

Df = Dilution factor.

%S = Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. 5, AA:

Conc. = (7560)(10)(2.06) / (830489)(0.42068)( )
= 0.4476 ppbv (165.83)/(24)
= 3.08 ug/M3

#	Sample ID	Compound	Reported Concentration (ug/m3)	Calculated Concentration (ug/m3)	Qualification
	5	5	1.2	1.2	-
		AA	3.1	3.1	-
	5 (SIM)	= (8380/3201694 - 0.00006)(10)(2.06)/0.23576			
		= 0.22402 ppbv (131.4)/(24)			
		= 1.23 ug/m3			